CLAIM AMENDMENTS

1. (Currently Amended) A reactor and heat exchanger cooler assembly which is comprised of a tubular reactor having an upper inlet head and ~~an~~ a lower outlet head, reaction tubes packed with catalyst within said reactor supported by an inlet end tube sheet and an outlet end tube sheet, a tubular heat exchanger having an upper end and a lower end, and comprising upper and lower end tube sheets supporting tubes within said exchanger, the upper end of said exchanger being integrally affixed to said reactor lower outlet head, said reactor outlet head having an opening for the passage of ~~the~~ reaction gases ~~gas mixture~~ from the reactor to said heat exchanger and through tubes in said heat exchanger whereby said reaction gases are cooled by indirect heat exchange with a heat exchange fluid introduced into said heat exchanger.

2. (Original) The assembly of claim 1 wherein means are provided for cooling the tubes in both the reactor and the heat exchanger with water.

3. (Original) The assembly of claim 1 wherein the reactor is packed with a supported silver catalyst.

4. (New) The assembly of claim 1 wherein the heat exchanger comprises a fluid introduction line.

5. (New) The assembly of claim 1 wherein the heat exchanger comprises a fluid removal line.

6. (New) The assembly of claim 1 comprising at least 20 thousand reaction tubes, wherein the reaction tubes have a length of from 15 feet to 40 feet, and an outside diameter of 1 inch to 2 inches.

7. (New) The assembly of claim 1 wherein the heat exchanger is welded to the reactor.

8. (New) The assembly of claim 1 wherein the heat exchanger has a diameter of from about 4 feet to 8 feet and contains tubes ranging from 800 to about 3000 in number and from about 1 inch to about 1.75 inches in outside diameter.

9. (New) A method for the oxidation of ethylene to form ethylene oxide which comprises,
a) providing a reactor and heat exchanger cooler assembly which is comprised of a tubular reactor having an upper inlet head and a lower outlet head, reaction tubes packed with catalyst within said reactor extending from the upper inlet head to the lower outlet head, said reaction tubes being supported by an inlet end tube sheet and an outlet end tube sheet, a tubular heat exchanger having an upper end and a lower end, and comprising upper and lower end tube sheets supporting tubes within said heat exchanger, the upper end of said heat exchanger being integrally affixed to said reactor lower outlet head, said reactor outlet head having an opening for the passage of reaction gases from the reactor to said heat exchanger and through tubes in said heat exchanger whereby said reaction gases in the heat exchanger are cooled by indirect heat exchange with a heat exchange fluid introduced into said heat exchanger;
b) introducing ethylene and oxygen into the reaction tubes and causing the ethylene and oxygen to react within the reaction tubes to form a reaction gas comprising ethylene oxide; and
c) cooling the reaction gas.

10. (New) The method of claim 9 wherein a ballast gas is additionally introduced into the reaction tubes.

11. (New) The method of claim 9 wherein the catalyst comprises supported silver.

12. (New) The method of claim 9 wherein the reaction tubes are cooled.

13. (New) The method of claim 9 wherein the reaction tubes are cooled with water.

14. (New) The method of claim 9 wherein the heat exchange fluid comprises water.

15. (New) The method of claim 9 wherein reaction gases passing from the reactor to the heat exchanger have a temperature of from 420 °F to 540 °F.

16. (New) The method of claim 9 wherein the reaction gases are cooled in the heat exchanger to a temperature of 420 °F or lower.

17. (New) The method of claim 9 wherein the cooling the reaction gas is conducted with a heat exchange fluid introduced into said heat exchanger by a fluid introduction line, which heat exchange fluid is subsequently removed by a fluid removal line.

18. The method of claim 17 wherein the heat exchange fluid comprises water.

19. (New) The method of claim 6 comprising at least 20 thousand reaction tubes, wherein the reaction tubes have a length of from 15 feet to 40 feet, and an outside diameter of 1 inch to 2 inches, and wherein the heat exchanger has a diameter of from about 4 feet to 8 feet and contains tubes ranging from 800 to about 3000 in number and from about 1 inch to about 1.75 inches in outside diameter.

20. (New) The method of claim 6 wherein the heat exchanger is welded to the reactor.